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ABSTRACT

The New Castle County Vocational-Technical School District in Wilmington, Delaware, has made great strides in integrating academic and vocational studies by adopting a "project" approach to integrated learning. Students at the district's high schools are involved in a variety of real-life projects aimed at advancing technical knowledge and skills. Delcastle Technical High School has developed the following three projects integrating academic and vocational studies: exploratory manual (students produce exploratory manuals while exploring career opportunities and developing job search skills); senior magazine project (students develop "trade" journals in their field of study); and cooperative work manual (students develop technical English skills by producing manuals documenting their work in their chosen occupational field). Seniors at Hodgson Vocational-Technical High School complete a senior project exhibition of achievement that combines the following elements: student-centered, career based research paper; applied product; and formal oral presentation before an audience. Howard High School of Technology's students complete a 4-year work experience called Quest for Quality, which helps them develop academic, personal, and group interaction skills. The projects have helped raise student achievement significantly. (Twenty exhibits are included.) (MN)

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Integrating Vocational and Academic Studies

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HIGH SCHOOLS THAT WORK

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Integrating

What Three

Vocational

High Schools

and

In Delaware

Academic

Are Doing

Studies

Acknowledgments

The New Castle County Vocational-Technical School District in Wilmington, Delaware, is a prime example of a school system that takes integration of academic and vocational studies seriously. The three schools in the district have made great strides with the "project" approach to integrated learning. Students at these schools are involved in a variety of real-life projects aimed at advancing technical knowledge and skills.

Dennis L. Loftus, superintendent of the New Castle County district, provides strong visionary leadership for these schools as they focus on improving student performance. The principals of the three schools are role models for administrators who are struggling to find ways to move their schools to a new plateau in student learning. The academic and vocational teachers at these schools deserve special recognition for spending long hours over many years in meetings, workshops, and retreats in working out the details for each activity and in planning ways to guide their students through the process.

In publishing this account of activities at the three high schools, SREB acknowledges the contribution of Mary An Scarbrough, head of the English department at Hodgson Vocational-Technical High School, for collecting the information and preparing the first draft. Her first-hand knowledge of the developmental steps and the current procedures for these activities was invaluable.

To bring this report to its final form, SREB called on Margaret Sullivan, a recently-retired staff member who graciously agreed to share her editorial talents in completing the publication.

The result is an account of how three high schools are raising student achievement by making dramatic changes in curriculum and instruction. Our purpose in sharing this information is to inspire other schools to expect more of career-bound students and to develop ways to help them succeed at school and at work.

This publication is supported in part by the U.S. Department of Education and the DeWitt Wallace-Reader's Digest Fund.

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Introduction

The SREB-State Vocational Education Consortium's High Schools That Work *program has one major goal—to improve the knowledge and skills of students in high school vocational-technical programs. The emphasis is on preparing students for success in an ever-changing, increasingly technological, global workplace and in equally demanding postsecondary education.*

This report focuses on the three schools—Delcastle Technical High School, Hodgson Vocational-Technical High School, and Howard High School of Technology—in the New Castle County (Delaware) Vocational-Technical School District. It describes the steps these schools are taking to implement specific programs that combine the strengths of academic and vocational disciplines. Taken together, they illustrate how teachers and administrators in other schools can build similar programs.

Setting the Stage

The three schools are located in the heavily populated, thriving northern area of Delaware surrounding Wilmington. The New Castle County Vocational-Technical School District serves 3,000 students from a county-wide population of 500,000.

All of these high schools offer students in grades 9 through 12 a full academic program, access to a broad range of vocational studies, extracurricular activities, and sports programs. All have been active participants in the *High Schools That Work* program since the 1989-90 school year. Each school is engaged in specific, teacher-developed projects that reinforce district-level efforts.

The district's and the high schools' approaches to academic and vocational integration were—and continue to be—shaped by:

- Strong growth in Delaware's economy, particularly in the Wilmington area;
- Expansion in financial services, health care, and new businesses relying heavily on technology;
- Significant growth in the facilities and research centers of established chemical manufacturing firms;
- Recognition of the need for curriculum changes based on the goals and key practices advanced by the Southern Regional Education Board;
- The enthusiasm of committed high school teachers;
- Strong support and practical guidance from district and school administrators;
- Feedback from students enrolled in these schools.

Data from the U.S. Bureau of Economic Analysis, the U.S. Bureau of Labor Statistics, and the U.S. Department of Agriculture reveal Delaware's dependence on manufacturing, service, and retail employment. This labor picture underscores the need to integrate academic and vocational studies in secondary schools.

Production and Workers in Delaware by Economic Activities

	Percent of Gross State Product	Employed Workers Number	Employed Workers Percent of Total
Manufacturing	28	70,200	20
Finance, Insurance, and Real Estate	18	32,500	9
Community, Social, and Personal Services	16	83,700	24
Wholesale and Retail Trade	13	74,200	21
Government	11	47,900	14
Transportation, Communications, and Utilities	8	15,100	5
Construction	4	17,800	5
Agriculture and Mining	2	6,700	2
	100	348,100	100

As the New Castle County Vocational-Technical School District and its schools began participating in the *High Schools That Work* program, leaders recognized that academic and vocational integration can better prepare students for postsecondary education and work. This meshing of traditionally separate curricula and goals is intended to significantly improve student achievement in communications, mathematics, and science; to help students learn analytical thinking; and to improve graduates' readiness for employment in the areas employers consider essential. The district and the schools recognized that students must be able to demonstrate their knowledge and skills in new and meaningful ways.

The first step was to include practical, concrete activities and examples in the mathematics and science curriculum, changes that rendered abstract concepts relevant to vocational fields.

Sweeping changes in the district's English curriculum came in 1990, when it became painfully obvious that:

- Students were not as prepared in reading, writing, listening, and speaking skills as prospective employers wanted;
- Further integration of academic and vocational disciplines was absolutely necessary;
- Students needed to be better prepared for Delaware's new State Assessment of Writing required of 10th grade students.

High school English teachers and the district's English specialist have labored ever since to design a more integrated, project-centered, writing-intensive program of study for students in grades 9 through 12.

The district program emphasizes the components of good writing—topic development, organization, sentence structure, word choice, voice, and literacy. Different forms of writing are emphasized at each grade level: 9th grade English focuses on expository and narrative writing, 10th grade focuses on analytical, 11th grade concentrates on argumentation and comparison and contrast, and the 12th grade course stresses technical writing.

As a result, students at the three high schools are graduating with significantly improved competence in written and oral language skills, a better chance for success in postsecondary education, and more skills useful to employers.

The district encouraged the three high schools to have teachers design long-term integrated projects that build on the new curriculum, include assessment of progress, and combine the strengths of academic and vocational-technical disciplines. In all cases, the projects require students to work in teams with supervision and support from academic and vocational teachers.

The district established a management information system to provide timely data on a number of key performance indicators. For example, the annual Performance Report provides data comparing current and previous years, upward or downward trends, standards of acceptance and excellence, and goals for the coming year in 10 categories. The categories tracked in the report are student attendance, discipline, academic skills, vocational skills, market share (number of students who apply and register), enrollment retention and graduation, graduate follow-up, staff attendance and job satisfaction, customer (parent and student) satisfaction, and the school's image and competitive position (students' awareness of the school and the reasons for choosing it). (See Exhibit 1 for the district's 1994 Performance Report.)

This ongoing system of reporting data helps administrators evaluate progress toward specified goals, compare the effects of strategies, and identify problem areas or negative trends which need attention. The system also provides insight for strategic planning for the future. Each year, the schools receive four performance reports, one at the end of each marking period, enabling each principal to share the reports with their faculty and make adjustments in school initiatives.

Since teachers now expect more of their students and hold them accountable for project activities, English and vocational grades have improved. Students working in teams find that the old "That's too hard; I won't be able to do it, so I won't even try" attitude is unacceptable to teachers and fellow team members. A new outlook—a "mission accomplished" confidence—prevails.

And as academic and vocational teachers work more closely together, camaraderie and respect have developed.

Through replicating practices commonly employed in business and industry, students gain knowledge and skills that strengthen their employment potential.

Examples of Vocational Programs Offered in New Castle County Vocational-Technical School District

- Electronics
- Chemical Laboratory Technology
- Graphic Arts
- Nurse Technician Training
- Aviation Mechanics
- Early Childhood Education
- Plumbing
- Culinary Arts
- Engine Technology
- Horticulture
- Communications Technology (Video and Photography)
- Auto Body Repair
- Power Plant Technology
- Dental Lab Technology
- Carpentry
- Heating, Ventilation, and Air Conditioning Maintenance Technology
- Information Systems and Services
- Masonry
- Cosmetology
- Welding
- Visual Communications
- Medical Assisting
- Technical Drafting
- Auto Technology
- Practical Nursing
- Electrical Trades
- Dental Assisting
- Environmental Technology
- Machine Technology
- Public Service Training
- Sheet Metal
- General Construction
- General Mechanics
- Supermarket Careers

Questions to Ask About an Integrated Activity

- Is the learning experience intellectually stimulating?
- Does it have a purpose that makes sense to students?
- Does it contain challenging academic and technical content?
- Does it involve both vocational and academic teachers?
- Does it include a variety of instructional methods?
- Will it require adjustments in scheduling or other classroom logistics?
- Do assessment strategies require students to demonstrate their ability to use what they have learned?
- Are students involved in developing assessment criteria? In evaluating their own work systematically?
- Are parents encouraged to support students and make suggestions?
- Is the community used as a resource in developing or evaluating the project?

EXHIBIT 1

New Castle County Vocational-Technical School District

DISTRICT SUMMARY

Performance Report

August 29, 1994

PERFORMANCE INDICATOR	SCHOOL YEAR 1990-91	1991-92	1992-93	1993-94	TREND + (Upward) - (Downward)	STANDARD OF ACCEPTANCE	STANDARD OF EXCELLENCE	GOAL SY 94-95
ATTENDANCE								
Average Daily Attendance	2845.3	2446.9	2527.7	2610.8	+			
Average Daily % Attendance	90.8%	91.5%	91.4%	92.1%	+	91.7%	95.0%	
Grade 9								
Grade 10								
Grade 11								
Grade 12								
% Students with <5 absences	---	---	---	19.1%				
% Students with <10 absences	---	---	---	46.1%				
DISCIPLINE								
# INFRACTIONS	14245	10572	14253	12813	-			
Smoking	366	283	476	433				
Leaving without Permission	389	423	392	322				
INFRACTION RATE	4.55	3.95	5.15	4.52	-			
# SERIOUS INFRACTIONS	884	1032	1117	1170				
Vandalism/Theft/Arson	68	46	65	96	+			
Drugs/Alcohol (Possession,Use)	34	31	23	48	+			
Fighting/Assault	336	302	236	239				
Weapons (Possession,Use)	9	10	17	19	+			
Defiant Behavior	437	643	776	768				
SERIOUS INFRACTION RATE	0.28	0.39	0.40	0.41				
# INSIDE SUSPENSIONS	2819	2979	3455	2514	-			
INSIDE SUSPENSION RATE	0.90	1.11	1.25	0.89	-			
# OUTSIDE SUSPENSIONS	1666	1279	963	841	-			
Grade 9	429	251	186	216				
Grade 10	561	398	307	291				
Grade 11	378	372	275	175				
Grade 12	297	258	195	159				
OUTSIDE SUSPENSION RATE	0.53	0.48	0.35	0.30	-	0.30	0.10	
# Students with Outside Suspensions	1045	735	624	495	-			
% Students with Outside Suspensions	35.5%	26.2%	21.9%	17.0%	-	20.0%	5.0%	

Exhibit 1 (cont'd)

New Castle County Vocational-Technical School District

DISTRICT SUMMARY

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August 29, 1994

PERFORMANCE INDICATOR	SCHOOL YEAR				TREND + (Upward) - (Downward)	STANDARD OF ACCEPTANCE	STANDARD OF EXCELLENCE	GOAL SY 94-95
	1990-91	1991-92	1992-93	1993-94				
ACADEMIC SKILLS								
NORM REFERENCED TESTING (*Stanford)								
Reading NCE	43.3*	43.2*	42.9	43.9		42.5	52.5	
Math NCE	44.7*	43.5*	43.5	44.8		42.5	52.5	
GRADE 10 MATH ASSESSMENT								
% Superior			2%	5.5%	+			
% Developing			44%	53.6%	+			
% Unsatisfactory			54%	40.9%				
% Developing and Above			46%	59.1%	+	75%	90%	
% Improving Over Grade 8			NA	NA		10%	20%	
GRADE 10 READING ASSESSMENT								
% Superior			8%	11.0%	+			
% Developing			57%	53.4%	+			
% Unsatisfactory			35%	35.5%				
% Developing and Above			65%	64.4%		75%	90%	
% Improving Over Grade 8			NA	NA		10%	20%	
GRADE 10 WRITING ASSESSMENT								
% Superior			8%	11.6%	+			
% Developing			63%	63.3%				
% Unsatisfactory			29%	25.0%				
% Developing and Above			71%	74.9%	+	75%	90%	
% Improving Over Grade 8			NA	NA		10%	20%	
FINAL GRADE DISTRIBUTION								
% of A's			13.6%	18.7%				
% of B's			25.8%	22.9%				
% of C's			30.7%	27.6%				
% of D's			15.3%	13.2%				
% of F's			14.5%	17.6%		15%	8%	
Grade Point Average			2.09	2.12				
GRADE 12 SCHOLASTIC APTITUDE								
# Taking SAT			157					
Verbal Score			327					
Math Score			361					

EXHIBIT 1 (cont'd)

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PERFORMANCE INDICATOR	SCHOOL YEAR 1990-91	1991-92	1992-93	1993-94	TREND + (Upward) - (Downward)	STANDARD OF ACCEPTANCE	STANDARD OF EXCELLENCE	GOAL SY 94-95
VOCATIONAL SKILLS								
% Certified Exemplary	---	---	18.1%	15.5%		20%	40%	
% Certified Standard	---	---	57.3%	59.3%				
% Certified Limited	---	---	24.6%	25.3%				
CO-OP EMPLOYMENT	Mar 91	Mar 92	Mar 93	Mar 94				
Senior Population	---	593	652	562				
# Eligible for Co-op	---	286	357	295				
# Participating in Co-op	---	228	270	234				
# in Related Co-op	---	218	254	224				
% Eligible	73.4%	48.2%	54.8%	52.5%				
% Eligible Employed	53.1%	79.7%	75.6%	79.3%		85%	95%	
% Employed in Related	91.0%	95.6%	94.1%	95.7%		90%	99%	
% Senior Population in Related Co-op	35.5%	36.8%	39.0%	39.9%				
# Requested (5/1 - 4/30)	---	---	708	672				
# Placed (5/1 - 4/30)	---	---	496	341				
% Placed of Requested	---	---	70.1%	50.7%				
CO-OP EMPLOYER EVALUATIONS (Highest rating = 5)								
Job Skill	---	3.76	3.85	3.97				
Accuracy of Work	---	3.78	3.81	3.90				
Quantity of Work	---	3.87	3.91	3.90				
Safety Practices	---	3.95	3.89	4.00				
Attitude	---	4.16	4.07	4.13				
Initiative	---	3.99	3.96	4.01				
Cooperation	---	4.23	4.25	4.20				
Responsibility	---	3.98	3.99	4.03				
Potential	---	4.16	4.12	4.14				
Punctuality	---	4.13	4.05	4.03				
Personal Appearance	---	4.01	4.09	3.94				
Overall Average Rating	---	4.00	4.00	4.01		4.00	4.25	
FINAL GRADES (VOCATIONAL)								
% of A's				17.8%				
% of B's				33.8%				
% of C's				27.8%				
% of D's				10.6%				
% of F's				10.0%				
Grade Point Average				2.39				

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Exhibit 1 (cont'd)

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MARKET SHARE								
Total Grade 8 Public School Enrollment	4256	4354	4661	4828	+			
Share of Grade 8 Public School Enrollments	---	26.6%	28.7%	29.6%	+	25%	33%	
GRADE 9 APPLICATIONS	1091	1215	1423	1526	+			
GRADE 9 ASSIGNED	873	934	944	1068	+			
Ratio of Assigned to Applied	80.0%	76.9%	66.3%	70.0%				
GRADE 9 REGISTERED	635	756	790	839				
% Registered of Assigned	72.7%	80.9%	83.7%	78.6%				
Ratio of Registered to Applied	58.2%	62.2%	55.5%	55.0%				
ENROLLMENT RETENTION								
GRADE 9 ENROLLMENT (9/30)	740	676	747	824	+			
Grade 10 Re-applications	701	653	713	794	+			
Grade 10 Re-applications to School	---	642	695	776	+			
% Re-applying to School	---	95.0%	93.0%	94.2%				
% Re-applying to District	95.0%	96.6%	95.4%	96.4%		95%	99%	
Grade 10 New Applications	---	227	251	250				
GRADE 10 ENROLLMENT (9/30)	912	807	760	861				
GRADE 11 ENROLLMENT (9/30)	---	---	692	636				
GRADE 12 ENROLLMENT (9/30)	567	582	654	596				
% ENROLLMENT RETURNING (10-12)	75.4%	71.7%	71.7%	73.9%		80%	90%	
TOTAL FULL-TIME ENROLLMENT (9/30)	2844	2709	2762	2813	+			
TOTAL PART-TIME ENROLLMENT (9/30)	103	97	92	104				
TOTAL ENROLLMENT (9/30)	2947	2806	2854	2917	+			
TOTAL ENROLLMENT (6/1)	---	2649	2713	2734				
# Dropping Out (7/1-9/30)	---	---	14	3				
# Dropping Out (10/1-6/30)	---	33	19	32				
% Dropouts (7/1-6/30)	2.3%	1.2%	1.2%	1.3%		2%	1%	
# Withdrawals (10/1-6/30)*	---	---	141	201	+			
% Withdrawals (10/1-6/30)*	---	---	4.9%	6.9%	+			
(*Includes Dropouts)								

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Exhibit 1 (cont'd)

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PERFORMANCE INDICATOR	SCHOOL YEAR 1990-91	1991-92	1992-93	1993-94	TREND + (Upward) - (Downward)	STANDARD OF ACCEPTANCE	STANDARD OF EXCELLENCE	GOAL SY 94-95
GRADUATION								
Senior Enrollment (6/1)	---	---	604	547				
# JUNE GRADUATES	---	---	539	502				
# June Graduates (4 yrs.)	---	---	531					
% Graduating on Time	---	---	87.9%					
% Graduates with 3+ Math				34.1%				
% Graduates with 3+ Science				35.1%				
GRADUATE FOLLOW-UP								
SURVEY SAMPLING FRAME		---	500	538				
RESPONSES		---	n=264	n=287				
A Full-Time Employment		---	39.4%	40.7%				
B Related Full-Time Employment		---	26.1%	22.6%				
C Part-Time Employment		---	32.2%	31.3%				
D Related Part-Time Employment		---	9.5%	11.1%				
E Military		---	5.7%	2.8%				
F Full-Time College		---	28.4%	32.0%				
G Part-Time College		---	5.6%	8.0%				
H Unemployed		---	11.4%	13.9%				
I B or F or E		---	60.2%	57.4%		60%	80%	
% EXPECTATIONS MET		---	76.4%	77.5%		80%	90%	
General Satisfaction Rating (1=Very Dissatisfied; 5=Very Satisfied)		---	3.87	3.87		3.85	4.05	
STAFF ATTENDANCE/SATISFACTION								
# Staff	---	259	253	267				
Average # Sick/Personal Days	---	5.5	5.4	5.0		5.0	3.0	
% Staff Attendance	---	97.0%	97.0%	97.2%				
Job Satisfaction Rating (1=Very Dissatisfied; 5=Very Satisfied)	---	4.00		4.15	+	4.00	4.20	

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CUSTOMER SATISFACTION								
PARENT SURVEY		n=378		n=404				
(1=Very Dissatisfied; 5=Very Satisfied)								
Quality of Teachers	---	3.94	---	4.00		3.90	4.10	
Prep for Career Employment	---	3.81	---	4.05	+	3.80	4.00	
Prep for College	---	3.42	---	3.71	+	3.40	3.60	
Overall Satisfaction	---	3.83	---	4.01		3.80	4.00	
% Expectations Met	---	87%	---	90%	+	85%	95%	
STUDENT SURVEY		n=1961		n=1910				
(1=Very Dissatisfied; 5=Very Satisfied)								
Quality of Teachers	---	3.40	---	3.39		3.40	3.60	
Prep for Career Employment	---	3.76	---	3.82		3.75	3.95	
Prep for College	---	3.32	---	3.42		3.30	3.50	
Overall Satisfaction	---	3.45	---	3.49		3.45	3.65	
% Expectations Met	---	83%	---	82%		90%	90%	
IMAGE/COMPETITIVE POSITION								
CONSUMER SURVEY	n=602							
(GPA Rating 4.00 = A)								
Prep for College	1.76	---	---			2.00	2.50	
Quality of Teachers	2.54	---	---					
Writing & Communication	1.94	---	---			2.00	2.50	
Develop Career Goals	2.93	---	---			3.00	3.50	
Employment w/o College	3.20	---	---					
Attention to Below Average	2.05	---	---					
Math and Science	1.99	---	---			2.00	2.50	
Attention to Above Average	2.17	---	---					
% Intending to Use District	23.3%	---	---					
% Not Informed of District	27.4%	---	---					

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Delcastle Technical High School's Integration Projects

Delcastle Technical High School, the largest of the three schools in the New Castle County Vocational-Technical School District, serves 1,450 students. Located in Newport, a Wilmington suburb, Delcastle is a comprehensive high school offering a variety of vocational-technical career programs, including cooperative work opportunities in such diverse fields as aviation mechanics, graphic arts, and power plant technology.

Three projects integrating academic and vocational studies are under way at Delcastle. They are the Exploratory Manual, the Senior Magazine Project, and the Cooperative Work Manual. All originated in individual teachers' classrooms.

Choosing a Career: The Exploratory Manual

Many high school students lack sufficient knowledge of the business world to make clear-cut choices of the career they would like to pursue. To ensure that students are aware of the many careers open to them, 10th grade students begin to explore career choices by developing the Exploratory Manual.

English teachers conduct lessons on résumé, essay, and letter writing; library research; documentation; and interview and telephone skills. All are required for successful completion of the manual.

Vocational instructors arrange class and individual student visits to job sites and engage in-class speakers from business and industry. The teachers themselves serve as a valuable resource for the vocational-technical information students need to successfully complete the project.

The Exploratory Manual contains:

- A title page
- A table of contents
- A résumé
- A vision statement
- A work ethics contract
- A pictorial essay
- Awards/Honors
- School attendance record
- A career-related library research report with bibliography
- Safety information
- Sketches of work area with safety features
- Career terminology
- Letters of request
- Thank you letters
- Interview write-ups

- Sample employment application forms from sites visited
- College information write-ups
- College brochures and pamphlets
- A personal essay titled "The Impact of My Research on My Career Goal"

As students work on their manuals, they acquire many of the skills needed for successful completion of the projects required of all graduating seniors. When completed, the manuals provide potential employers with visible evidence of the students' practical knowledge and skills in the process of job application and performance requirements. Students are encouraged to enter their manuals in the Vocational Industrial Clubs of America (VICA) state competition.

Senior Magazine Project

Magazines covering useful information to persons engaged in many occupations constitute a large portion of the publishing industry. These "trade" journals demonstrate the talents and skills of those who work on them:

- Technical writing that clearly and concisely conveys helpful information and descriptions of advances in the given field;
- Skillful interviewing techniques to obtain information;
- Graphics that illustrate concepts;
- A format that is inviting to the reader;
- Compelling advertisements inducing readers to buy products and services;
- A plan for the contents of each issue.

The Senior Magazine Project enables Delcastle's upcoming graduates to produce career-related magazines demonstrating their skills and their knowledge of the vocational field they intend to pursue. All students not engaged in a Cooperative Work Program (an alternative project described later) must complete the Senior Magazine Project as part of the 12th grade Technical English course.

At the beginning of their senior year, four students (either in the same or related fields) form a team to produce a magazine. The six components for the magazine involve individual and group contributions.

Each student is required to submit the following pieces about their field of study for the magazine:

- Their three best efforts in
  - an interview with an acknowledged expert in the field;
  - a how-to article;
  - a review of a field-related book;
  - an article, including two visuals, on new products or vocational-technical developments (demonstrating comparison and contrast);
  - an article, including two visuals, on opportunities for career advancement or further education.

- A full-page advertisement of a product or service.

The group must agree on and produce:

- A magazine cover with an interesting graphic design and an appropriate title;
- A table of contents;
- An editor's page detailing each individual's contributions;
- A bibliography listing all sources (each magazine article requires a minimum of two sources).

During the first two marking periods, students learn the process of producing their magazines. English and vocational grades are given for materials that will ultimately be used in the magazine. The articles students select to illustrate the three types of technical writing are the best of many choices. Once selected, students revise, rewrite, and proofread the articles. In most cases team members handle the entire production process, but they may ask students from other fields for specialized help with graphics or printing, for example.

Evaluation of the students' efforts is an integral part of this project. Magazines are produced on a computer and inserted into a binder for evaluation by the English teacher and the vocational teacher. The English teacher evaluates the magazine based on the parameters of proper technical English; vocational teachers evaluate the team's technical expertise in their fields of study.

In addition to developing expertise in both English and vocational skills, the students become aware of the multitude of practical factors involved in using language skills to successfully complete any project. They acquire an understanding of the dynamics of teamwork and the need to communicate clearly with persons both within and outside their vocational field.

New vistas open as students realize that writing about their trades conveys knowledge of their skills as much as performing them does.

Cooperative Work Manual

The Cooperative Work Manual is the alternative requirement for 12th grade students who are in the Cooperative Work Program's Technical English course. Aspects of Technical English incorporated into the manual include using a technical format, giving instructions, preparing visuals, writing technical definitions, describing mechanisms, interviewing experts, researching information, and writing reports.

The Cooperative Work Manual includes:

- A description of the student's chosen occupational field;
- A description of the operation of the company where the student is employed;
- A description of the student's co-op job;
- A diary of the student's work experience.

Directed to a practical, real-world application of knowledge and skills, the Cooperative Work Manual:

- Assists the student in understanding his/her job;
- Emphasizes the role of cooperative employment in career planning;
- Provides a portfolio of the student's work experience;
- Integrates language skills with vocational experience to demonstrate the relevance of academic classes.

A selection process is used for entering the best manuals in the Delaware VICA competition.

Results

Teachers and administrators at Delcastle point with pride to gains that have been made through integrating academic and vocational studies. A major change has taken place in teachers' expectations for students and in students' motivation to meet and exceed these expectations. Students are learning to take responsibility for their own actions and to assume active roles in group projects. They are recognizing that the ability to "take the ball and run with it" is essential for future success.

Student attendance has risen to 92 percent, and disciplinary infractions have declined. More students are employed full-time in fields related to their vocational areas, and 49 percent of graduates are continuing their education.

More students are earning A's and B's in their vocational studies, and the percent of students failing is below the acceptable level set by the district.

Academic grades are improving, and grade point averages are rising. A large percent of Delcastle students—compared to students at many other Delaware schools—meet or approach state writing standards.

And in spite of higher standards, more students are staying in school and graduating.

Teachers, too, are finding new respect for each other's disciplines. Cooperation is the operative word as the school plans to expand integration efforts.

Examples of Senior Magazines

Technology Interviews

Students in chemical laboratory, visual communications, electronics, and industrial electricity explore the question *"How far will electronics go?"*

The Yearly Vocational Report

Students in auto body repair, technical drafting, and visual communications focus on developments in their fields.

Cosmodentalan

Students in cosmetology and dental programs concentrate on typical procedures with the goal of improving care and services in these professions.

The Collage

Students in graphic arts, electronics, and information systems and services explore new products on the market.

Tricks N Trades

This journal was written and produced by students in visual communications and information systems and services.

F.E.D.S.

An acronym for Future Engineers of Delcastle Shops, this magazine was developed by students in technical drafting, carpentry, and industrial electricity/electrical trades.

Suggestions for Conducting the *Senior Magazine* Project at Other Schools

Delcastle prints a limited number of senior magazines. The pages are printed on a computer or a copier and are inserted in binders that hold 8 1/2 x 11-inch paper.

Teachers and students who adapt the project at their schools may want to vary the size of the magazine or print enough copies for students to distribute to family and friends. Schools offering graphic arts, printing, and business-related programs may want to involve students from these areas to determine the cost of printing the magazine. The factors to be considered include:

- Dimensions of the magazine.
- Number of pages and type of binding.
- Paper recommendations based on price considerations.
- Ink colors and cost.
- Layout and preparation of the magazine for printing.
- Quantity to be printed.
- Copy deadlines and printing time.
- Total cost and cost per copy.

Hodgson Vocational-Technical High School's Senior Project Exhibition of Achievement

Paul M. Hodgson Vocational-Technical High School serves over 900 students from throughout New Castle County. The school offers 20 career programs ranging from auto body repair, carpentry, and electrical trades to electronics, dental laboratory, and information systems and services training. These programs are offered in conjunction with a comprehensive academic program of study.

In its simplest form, Hodgson's Senior Project combines three elements:

- A student-centered, career-based research paper;
- An applied product;
- A formal oral presentation before an audience.

Students select challenging topics such as irrigation and drainage systems, care and treatment of pediatric AIDS patients, and automobile restoration. Their products range from banquets and furniture to instructional videotapes and software programs.

The Senior Project process involves the entire school and is serving as the focal point for changes in curriculum development, personnel, scheduling, and physical facilities. It has forced faculty and administrators to shift from philosophical goals for graduation to concrete activities for exhibition throughout a student's four-year experience at Hodgson.

Examples of Senior Project Topics

Animal Diagnosis through Computers in a Veterinary Hospital
(Information Systems)

Cape Cod Home Design and House History
(Technical Drafting)

Diagnostic Reasons for X-rays
(Dental Assistant)

Care and Treatment of Pediatric Patients with AIDS
(Nurse Technician)

Cosmetic Restoration of Late-Model Domestic Automobiles
(Auto Body Repair)

Politically Incorrect Design
(Visual Communications)

Irrigation and Drainage Systems of Sports Fields
(Plumbing)

Hair Replacement
(Cosmetology)

ADHD (Attention Deficit Hyperactive Disorder)
(Early Childhood Education)

Remodeling a Home for the Physically Challenged
(Carpentry)

Rock Gardens and Water Features
(Horticulture)

The Social and Economic Impact of Electricity
(Electrical Trades)

Solar Water Heating
(Air Conditioning)

Aluminum Recycling
(Maintenance Technology)

Examples of Senior Project Products

- A cabinetmaking student built a Pennsylvania Dutch hutch;
- Several students worked together to build and furnish a scale model Victorian doll house;
- A student in early childhood education produced a videotape showing how to teach an autistic child;
- A medical technician student arranged for a breast cancer detection day that included mammogram testing;
- A student in computer sciences developed a software program to combat computer viruses;
- A culinary arts student planned and prepared the school's annual athletics banquet.

The project was created, and continues to flourish, due to a consolidated effort on the part of the Hodgson faculty, students, and the local business community. What began as a way for senior students to demonstrate integrated vocational and academic skills in one major project has evolved into a schoolwide reform initiative.

In the fall of 1985, Hodgson became a full-time comprehensive high school instead of a share-time facility. In an attempt to make the English curriculum more relevant to students, the department replaced literary analysis with a career-based research paper integrating language skills and vocational areas. This change included a new term paper project in which seniors wrote about unusual aspects of their vocational fields. For example, a cabinetry student might choose to investigate and describe a particular style of furniture making.

This assignment resulted in pronounced positive effects. Students found interest, support, and success in what had previously been a tedious and intimidating task, and vocational instructors saw their subject areas valued by students and academic teachers. Instead of focusing exclusively on the finished paper, teachers considered the entire research and development process in grading the project. In the fall of 1989, Delaware joined the SREB-State Vocational Education Consortium's *High Schools That Work* program, and Hodgson applied to become a member of the Coalition of Essential Schools. At the same time, a school committee at Hodgson investigated the idea of expanding the senior term paper to create a multi-component senior project requiring students to demonstrate skills learned in both career and academic studies. For example, a student might develop written and oral reports on Pennsylvania Dutch furniture and build a reproduction of a corner hutch. Thus the Senior Project was born.

Senior Project Design

At the beginning of the Senior Project, each student:

- Assumes responsibility for certain actions and signs a contract of commitment to the project (see Exhibit 2). Parents also sign the contract.
- The student selects a faculty advisor from a pool that includes academic and vocational teachers, the guidance counselor, the school nurse, and the school librarian. The advisor, who is fully aware of his or her responsibilities, also signs a contract (see Exhibit 3).
- In consultation with his or her advisor, each student selects a project committee that includes the advisor, a teacher from the student's vocational program, an English teacher, and a teacher from another academic or vocational discipline. In addition, the student may include a representative from business or industry to offer advice throughout the process and to attend the student's oral presentation. Each committee member signs a contract agreeing to accept specified responsibilities (see Exhibit 4).
- With guidance from the advisory committee, the student chooses a topic for research and development into a paper and a product. Everyone involved with the project signs a Final Topic Form (see Exhibit 5).

As the school year progresses, the student and his or her committee maintain a Senior Project Checklist of tasks (see Exhibit 6).

- The student researches the topic, prepares the first draft of a paper, and submits it for comments. The draft is accompanied by a cover sheet signed by committee members.
- From research, the student decides on a tangible product to create that applies knowledge in a real-life way.
- The student demonstrates the relationship between research and the product during a 15- to 30-minute oral presentation and defends the planning and development during a question-and-answer period.
- The student's English teacher and vocational teacher grade the tasks leading to completion of each part of the Senior Project and include the grades in the current marking period.
- Students also receive grades for the final paper, the related product, and the oral presentation (see evaluation forms in Exhibits 7-11).
- The overall project grade—an average of grades on the three parts of the project—is included in the student's final grade in English and in the vocational area. It also shows up as a separate entry on the student's final report card.
- Students who achieve excellence in all aspects of the Senior Project receive awards at graduation.

All students in the senior class participate in the Senior Project. Special education students, who are grouped into a separate English class but mainstreamed into all vocational areas, follow the same project guidelines as other students. However, they have a longer period of time to complete their projects and often receive extra help and support from academic and vocational teachers.

Teachers and administrators designed an alternative class schedule to make the senior project do-able for Cooperative Education students. These students spend two weeks each

month in class and two weeks at work. Also, they usually take half a course load. To have enough English class time to complete the project, they spend a double period each class day in English, an adjustment that gives them a better shot at successfully completing all the tasks required by the project.

Faculty support is essential to the project's success. So that faculty would understand the project's purpose and design as well as the necessity of cooperation between academic and vocational teachers, staff participated in in-service workshops before the beginning of the school year. A two-day staff development workshop is conducted each summer to familiarize teachers with the project.

An eight-member Senior Project Evaluation Committee, composed of administrators and teachers (academic and vocational), initiates "conversations" with individual faculty members and invites reactions from the rest of the staff (see Exhibit 12).

The committee devised the overall structure of the project, established guidelines, and published a *Senior Project Manual* explaining the project to students and their parents.

The evaluation committee meets regularly to handle problems, schedule students' presentations, and inform staff of progress. During the summer, the committee evaluates the Senior Project process and revises the manual as needed in preparation for the coming year.

Communication among the faculty is an ongoing job. Since students select their project advisors, every student's advisory committee is unique. Initially, each committee determined its role; some worked very closely with students, while others were less active. The evaluation committee responded by writing guidelines for advisors and committee members.

The *Senior Project Manual* is distributed to all seniors at the beginning of the school year. It includes an overview of the process, a time line, an example of a Senior Project, forms, and a checklist to help students stay on task. It also states the responsibilities of students, English and vocational teachers, and librarians in the year-long process (see Exhibits 13, 14, and 15).

With the help of communication specialists, the Hodgson staff created a videotape introducing the Senior Project to teachers, students, and parents. The tape demonstrates each step of the process and includes footage of student presentations. Faculty and student interviews provide candid insight into the project.

What Are the Results of the Senior Project?

Gains in student achievement are the most important results of the project. Through a series of interviews and surveys the school has been able to document:

- Increased time spent on homework and class work.
- Improved written and oral communication skills.
- A new proficiency in conducting research.
- An increased ability to reason and to react intelligently to questions.
- A capability to recognize potential problems and to solve them.
- Improved grades, with many more A's and B's each marking period. The number of F's is at an all-time low.

In addition, Hodgson students consistently score higher on the Delaware State Writing Assessment than do students from most comprehensive public high schools—vocational or academic.

What do the students think of the Senior Project? Members of the 1994 senior class had these observations:

- 94 percent said they "learned how to use the research process";
- 90 percent said the project was challenging;
- 71 percent called it a "worthwhile activity";
- More than two-thirds said they "improved the skills and behaviors teachers consider important";
- Almost 90 percent reported that they "received support and help" from their advisors and committees.

The faculty has received powerful, unanticipated benefits from the project:

- Staff from all disciplines participate in giving advice and support to the students;
- Teachers gain new appreciation for their colleagues as they work together in teams, share information, and advise students in the project;
- Vocational and academic teachers have created a partnership for a common good—the improved education of students. The partnership has carried over into other aspects of the school;
- Teachers willingly, and without extra financial remuneration, give their time and talents to serve on advisory committees, develop strategies for change and implementation, and travel to workshops and schools to share ideas and gather new information that will help them continue to integrate academic and vocational curricula;
- Teachers maintain closer contact with parents as students work through the stages of project research and development. They encourage parental suggestions and assistance.

A major factor in the success of the project has been the district-level revamping of the English curriculum. With the help of business leaders and college officials who identified writing skills they considered essential, teachers were able to analyze the educational needs of students and incorporate the necessary reading, writing, listening, and speaking skills. This evaluation was carried out not only in the senior technical writing course, but also in the 9th, 10th, and 11th grades.

The Hodgson curriculum is being redesigned to prepare underclassmen for the demands of a long-term research-related product. Beginning in the ninth grade, students (individually and in groups) perform tasks that require the same skills needed for the Senior Project.

As further preparation, faculty and graduates present the Senior Project to 11th-grade students to help them begin thinking about their own projects.

Exhibit 2

Paul M. Hodgson Vocational-Technical High School
Senior Project

Role of the Student

1. Select a Project Advisor.
2. Select four Project Committee members and invite them in writing to serve on the committee.
3. Select a project topic and secure the approval of the Project Committee.
4. Make entries in a journal concerning meetings with the advisor and the committee.
5. Document in the journal the time spent on designing and building a product. The vocational teacher must verify the time.
6. Follow the checklist and a time line for completing the project.
7. Make any changes through the Senior Project Evaluation Committee.
8. Duplicate and distribute to Project Committee members a rough draft and final copy of the research paper.
9. Return all Senior Project forms, reviewed rough drafts, and graded final copies to senior English teachers.
10. Write thank you notes to committee members within five days after the oral presentation.

Senior Contract

I (we) understand that successful completion of the Senior Project is necessary to fulfill certain academic and vocational graduation requirements.

_____	_____
Senior	Date
_____	_____
Parent/Guardian	Date

Exhibit 3
Paul M. Hodgson Vocational-Technical High School
Senior Project

Role of the Advisor

1. Serves as chairperson of the student's Senior Project Committee.
2. Advises the student in choosing appropriate committee members.
3. Approves the Senior Project topic in coordination with the student's committee.
4. Coordinates meeting(s) with the student and the committee concerning product development prior to submission of the product form.
5. Meets with the student and the committee on a regular basis throughout the school year.
6. Reviews a rough draft and grades the final copy of the research paper.
7. Assists the student in scheduling and planning the formal presentation.
8. Advises the student in planning the oral presentation.
9. Provides evaluation forms for the oral presentation.
10. Evaluates the presentation and the product.
11. Gives the student a grade and feedback on the presentation.
12. Collects all evaluation forms and returns them to the student's Senior English teacher.

Note: Advisors are limited to six advisees.

Advisor's Contract

I have read, understood, and agreed to the advisor's responsibilities set forth in the Senior Project Manual.

_____ _____

Advisor's Signature Date

EXHIBIT 4

Paul M. Hodgson Vocational-Technical High School
Senior Project

Role of the Project Committee

1. Function as a resource during the Senior Project process.
2. Approve the student's Senior Project topic.
3. Meet with the student concerning the selection and approval of the product.
4. Review the first draft of the research paper and suggest revisions.
5. Evaluate the final draft of the research paper.
6. Return to the student all Senior Project forms, rough drafts, and the graded final copy of the research paper.
7. Advise the student in planning the oral presentation.
8. Agree in writing to a presentation time, attend the presentation, and evaluate the student's performance.
9. Evaluate the product.
10. Serve as a liaison between the Senior Project Evaluation Committee and the student in arbitrary disputes, appeals, and other conflicts.

Note: Staff are limited to 10 committees, with the exception of English teachers, who are limited to 25 committees, and vocational teachers, who are limited to 15 committees.

Project Committee Members' Contract

I have read, understood, and agreed to the Committee Members' responsibilities set forth in the Senior Project Manual.

_____ _____

Signature Date

_____ _____

Signature Date

EXHIBIT 5

Paul M. Hodgson Vocational-Technical High School
Senior Project

Final Topic Form

Student's Name: _____

Senior Project Topic: _____

Advisor's Approval:

Signature: _____ Date: _____

Comments: _____

Vocational Teacher's Approval:

Signature: _____ Date: _____

Comments: _____

Committee Members' Approval:

Signatures: _____ Date: _____

_____ Date: _____

_____ Date: _____

Exhibit 6

Paul M. Hodgson Vocational-Technical High School

Senior Project Checklist

Name: _____ Vocational Area: _____ Topic: _____ Advisor: _____

Assignment	Due Date	Date In	Advisor	Vocational Teacher	English Teacher
Advisor contract					
Advisor/vocational teacher consultation/journal					
List of five possible topics					
Final topic form					
Senior contract					
Working bibliography					
Advisor/vocational teacher consultation/journal					
Preliminary question series					
List of five possible products					
Letters to committee members					
Committee member contract					
Note cards					
Advisor/vocational teacher consultation/journal					
Outline					
Introduction					
First draft to committee members					
Advisor/vocational teacher consultation/journal					
Final product form					
First draft back to English teacher					
Advisor/vocational teacher consultation/journal					
Final draft to committee members & English teacher					
Copies of paper to committee					
Presentation date form					
Advisor/vocational teacher consultation/journal					
Presentation/product journal					
Completion of student survey					
Hand in journal to English teacher					
Thank you notes					

Exhibit 7

Paul M. Hodgson Vocational-Technical High School

Senior Project: An Exhibition of Achievement
Paper Evaluation: Vocational Teacher

Name: _____ Date: _____

Vocational Area: _____ Advisor: _____

Topic: _____ Vocational Instructor: _____

Evaluation Components		Excellent	Good	Satisfactory	Unacceptable
Research	Total pts. 50	47-50	43-46	35-42	0-34
■ Variety of sources ■ Appropriate sources ■ Inclusion of current data ■ Appropriate visuals ■ Cites sources (lack of plagiarism) ■ Information is technically correct and up to date ■ Submitted on time					
Content	Total pts. 50	47-50	43-46	35-42	0-34
■ Adequate information to cover outline ■ Corrected rough draft according to suggestions ■ Introduces topic appropriately ■ Provides sufficient background for readers ■ Comprehensive and complete ■ Original—examines issues/ideas beyond basic concepts ■ Adequate conclusion					
Total Points					

Exhibit 8

Paul M. Hodgson Vocational-Technical High School

Senior Project: An Exhibition of Achievement
Paper Evaluation: English Teacher

Name: _____ Date: _____

Vocational Area: _____ Advisor: _____

Topic: _____ English Instructor: _____

Number of Pages: _____ Number of Sources: _____ Due Date: _____ Date Received: _____

Evaluation Components		Excellent	Good	Satisfactory	Unacceptable
Format	Total pts. 20	19-20	17-18	14-16	0-13
■ Correct title sheet ■ Correct subheadings, titles, numbering, margins					
Mechanics	Total pts. 20	19-20	17-18	14-16	0-13
■ Lack of typing errors; correct spelling ■ Correct grammar ■ Proper sentence structures					
Organization					
■ Appropriate introduction ■ Well-developed body ■ Adequate conclusion ■ Correct outline					
Documentation	Total pts. 20	19-20	16-18	14-15	0-13
■ Correct parenthetical citations ■ Correct works cited page ■ Reconciliation of parenthetical citations and works cited page ■ Appropriate visuals (labeled correctly, textual references) ■ Variety of sources ■ Cites sources (lack of plagiarism)					
Editing	Total pts. 20	19-20	16-18	14-15	0-13
■ Corrected rough draft according to suggestions					
Total Points					

Exhibit 9

Paul M. Hodgson Vocational-Technical High School

Senior Project: An Exhibition of Achievement
Paper Evaluation: Committee

Name: _____ Date: _____

Vocational Area: _____ Advisor: _____

Topic: _____ Vocational Instructor: _____

Evaluation Components	Excellent	Good	Satisfactory	Unacceptable
	9-10	8	7	0-6
■ Appropriate organization ■ Adequate development proportionally of introduction, body, and conclusion ■ Provides sufficient background for understanding ■ Informative ■ Thorough—covers topic sufficiently ■ Cohesive and coherent ■ Addresses a general audience ■ Evidence of research with appropriate documentation ■ Appropriate visuals for text ■ Makes adequate reference to product				
Total Points				
Comments				

Exhibit 10

Paul M. Hodgson Vocational-Technical High School

Senior Project: An Exhibition of Achievement
Product Evaluation

Name: _____ Date: _____

Vocational Area: _____ Advisor: _____

Topic: _____ Vocational Instructor: _____

Evaluation Components		Excellent	Good	Satisfactory	Unacceptable
Product Application	Total pts. 25	23-25	20-22	17-19	0-16
■ Exhibits research beyond knowledge demonstrated in vocational area ■ Demonstrates applied technical knowledge					
Product Development	Total pts. 30	28-30	25-27	20-24	0-19
■ Develops a product based on a research paper ■ Demonstrates creativity and originality ■ Shows evidence of planning and organization ■ Utilizes appropriate vocational resources ■ Completes project on time					
Technical Skills and Knowledge	Total pts. 25	23-25	20-22	17-19	0-16
■ Demonstrates technical skills and knowledge ■ Uses correct terminology					
Product Management	Total pts. 20	19-20	16-18	14-15	0-13
■ Completes project on time ■ Uses time efficiently ■ Displays organization skills ■ Verifies hours spent on product (40) (minimum of 25 hours in vocational area)					
Total Points					

Exhibit 11

Paul M. Hodgson Vocational-Technical High School

Senior Project: An Exhibition of Achievement
Presentation Evaluation

Name: _____ Beginning Time: _____

Date: _____ Ending Time: _____

Vocational Area: _____ Advisor: _____

Topic: _____ Vocational Instructor: _____

Evaluation Components		Excellent	Good	Satisfactory	Unacceptable
Content	**Total pts. 30**	**28-30**	**25-27**	**20-24**	**0-19**
■ Demonstrates a relationship between research and the product (verbally & visually) ■ Demonstrates expertise on the topic ■ Responds appropriately to questions					
Organization of Presentation	**Total pts. 30**	28-30	25-27	20-24	0-19
■ Introduces and concludes the talk ■ Has prepared the presentation carefully ■ Shows evidence of practice ■ Shows originality and creativity ■ Uses appropriate audio-visual aids, equipment, etc.					
Communication Skills	**Total pts. 20**	**19-20**	**16-18**	**14-15**	**0-13**
■ Speaks clearly (pitch, rate, volume, enunciation, pronunciation) ■ Uses correct grammar ■ Uses appropriate diction ■ Shows evidence of practice ■ Uses proper body language (posture, eye contact, gestures)					
Personal Appearance	**Total pts. 5**	5	4	3	0-2
■ Dresses appropriately for presentation					
Time Management	**Total pts. 15**	**14-15**	**12-13**	**10-11**	**0-9**
■ Stays within the 15-30 minute limit, excluding time for questions (except in groups)					
Total Points					

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Exhibit 12
Paul M. Hodgson Vocational-Technical High School
Senior Project

Role of Senior Project Evaluation Committee

1. Collect and publish project topics and committee rosters.
2. Arbitrate disputes, appeals, and other conflicts.
3. Inform the faculty about Senior Project activities.
4. Update and revise the *Senior Project Manual*.
5. Formulate policy.
6. Provide guidance to participants.
7. Establish guidelines, and select recipients of Senior Project Awards.
8. Plan in-service activities for the faculty in regard to the Senior Project.

Exhibit 13
Paul M. Hodgson Vocational-Technical High School
Senior Project

Role of Senior English Teacher

1. Collate and disseminate Senior Project forms and materials.
2. Instruct students in the proper form and process of a research paper.
3. Collect and evaluate all written documentation pertaining to the Senior Project checklist.
4. Instruct students in proper methods of journal/log writing.
5. Monitor journal writing and log documentation.
6. Review first drafts of research papers and suggest revisions after project committee review.
7. Evaluate final drafts of research papers.
8. Calculate final research paper grades based on committee evaluations.
9. Instruct students in methods of oral presentation.
10. Calculate final Senior Project grades.
11. Incorporate Senior Project grades as a minimum of 10 percent of students' final English grades.

Exhibit 14
Paul M. Hodgson Vocational-Technical High School
Senior Project

Role of Vocational Teacher

1. Serve on Senior Project committees.
2. Approve project topics in coordination with students' project committees.
3. Provide a minimum of 25 hours in a vocational area to each student for product development and construction.
4. Document the time students spend on product development and construction by entering the totals in the journal/log.
5. Assist and advise students in the technical contents of their research papers.
6. Review first drafts of research papers, and suggest revisions.
7. Evaluate final drafts of research papers.
8. Serve as a resource to students in all stages of product development.
9. Advise students in planning oral presentations.
10. Evaluate oral presentations.
11. Evaluate products.
12. Incorporate Senior Project grades as a minimum of 10 percent of students' final vocational grades.

Exhibit 15

Paul M. Hodgson Vocational-Technical High School
Senior Project

Role of Librarian

1. Help students develop research strategies.
2. Assist students in developing bibliographic materials.
3. Help students locate appropriate research materials.
4. Coordinate and schedule seniors' use of the resource lab and computers.

Howard High School of Technology's *Quest for Quality* Project

Howard High School of Technology, located in the city of Wilmington, enrolls over 550 students. The school offers a full academic program in addition to 12 career-directed programs, two of which (environmental technology and video production) are unavailable at the two other high schools in the district.

Howard's *Quest for Quality* project, a four-year school-to-work experience, is designed to educate students in skills that are essential for finding and keeping a job and for succeeding in postsecondary education. Howard grouped these skills into three general categories: academic, personal, and group interaction skills.

Academic Skills

- Read with understanding;
- Understand charts and graphs;
- Understand basic mathematics;
- Use mathematics to solve problems;
- Use research and library skills;
- Use tools and equipment;
- Speak effectively;
- Write effectively;
- Use problem-solving skills;
- Use technology;
- Demonstrate integration of skills.

Personal Skills

- Attend school and work regularly;
- Meet deadlines;
- Develop career plans;
- Know strengths and weaknesses;
- Demonstrate self-control;
- Attend to details;
- Follow instructions;
- Work independently;
- Learn new skills;
- Display creativity.

Group Interaction Skills

- Actively participate in group situations;
- Know and respect group rules and standards;
- Listen to and learn from all members of the group;
- Express ideas to the group;
- Be sensitive to group members;
- Compromise to achieve a goal;
- Lead—or follow—to accomplish a goal;
- Work in changing environments.

The *Quest for Quality* project is designed to help students develop and demonstrate these skills as well as their vocational skills.

How the *Quest for Quality* Project Began

Initiated in 1992, the *Quest for Quality* project builds on changes in the New Castle County Vocational-Technical School District and on recommendations from two task forces. Task Force I was created in 1989 to develop specific steps for improving the quality of learning. Representatives of the business community assisted school leaders and teachers with the task force. Task Force II was charged with evaluating progress and making recommendations for improvement.

The *Quest for Quality* Project Design

Task Force I recommended that "incoming students should be assessed in terms of competence in basic areas and placed in programs keyed to their needs in such areas as reading and writing, mathematics, science, and applied technology."

Before entering the 9th grade, students complete information forms describing their academic performance in the previous year. They also receive assistance in setting long- and short-term goals for their high school experiences.

At the beginning of the school year, each ninth-grader receives a Student Performance Guide designed to:

- Serve as a planning document;
- Aid students and teachers in assessing progress;
- Collect a student's best work;
- Provide students with a school exit document that helps them demonstrate academic, personal, and group interaction skills, as well as specific job skills.

Students, their parents, and their teachers sign a credo pledging their energy and support for the *Quest for Quality* project (see Exhibit 16). In signing the credo, students agree to take responsibility for assessing their overall progress.

With assistance from teachers and counselors, students work in small groups throughout the freshman year to assess their overall progress. A limited number of items is deposited in the

portfolio section of the performance guide. Students maintain their portfolios throughout high school to preserve best works and other items documenting academic, personal, and group interaction skills. For example, students might include Student of the Month or Honor Roll certificates, research papers, or documents verifying participation in a school club. All items are logged on a form in the guide as they are added to the portfolio section. Students write a brief description of each item and indicate the skill area it represents (see Exhibit 17).

The guide's summary sheets help students fill out job or college application forms and prepare resumes. These sheets contain basic information about the student and the school. They also list academic, personal, and group interaction skills the student has acquired that are specific to a career field (see Exhibits 18, 19, and 20).

The guide contains a glossary designed to provide a better understanding of employability skills. The guide defines each skill and gives examples of ways to use it at school, at work, and at home.

The Ninth Grade Program

Early in the school year, freshmen prepare a vision statement which goes into the performance guide. All ninth-graders receive one hour per week of *Quest for Quality* instruction during which they prepare a statement envisioning themselves after high school graduation, initiate career planning, and develop interaction skills through group work.

Learning activities, including role playing and simulation, are designed for a high level of student involvement. Topics range from program orientation to self-assessment activities timed to coincide with marking periods. Long- and short-term goal-setting is also addressed.

The ninth-grade program concludes with a student transition activity—an oral presentation by each student to a committee of teachers and business representatives. The students explain their vision statements, assess career choices, and present their best work. Through visuals such as illustrations and videotapes, students demonstrate what they have learned through their vocational experiences. Committee members encourage students toward excellence and make recommendations regarding their presentations. All students receive a certificate of program participation at an awards program.

These career area assessment activities, designed as integral components of the teaching and learning process, continue throughout the student's four years at Howard. Students assume more responsibility for assessment as their activities become more comprehensive.

The 10th Grade Program

Beginning in grade 10, the performance guide is maintained within the various career areas. While work continues on employability skills, goal-setting, and career planning, a new emphasis is placed on specific job skills. Students have the opportunity to re-evaluate their vision statements and goals, allowing for changes that may have occurred in their vocational programs and future plans. They also judge the quality of best work to be placed in the portfolio.

Tenth-grade students participate in the *Quest for Quality*'s job shadow program. In the job shadow experience, students spend approximately three hours twice a year observing one or more employees at their jobs. The job shadow coordinator recruits employers interested in sharing information about jobs and in helping students learn about career opportunities. The goal is for students to learn as much as possible from the experience by observing, listening, asking appropriate questions, and taking good notes. The school provides transportation to and from job sites.

The job shadow coordinator, guidance counselors, and others train students for this experience. A kit explains the process, lists the students' responsibilities, and includes worksheets for students to document and assess their experiences. Students must have the approval of parents, teachers, and the coordinator before they can participate. They sign a student contract agreeing to fulfill the requirements listed in the job shadow guide.

After the experience, students answer a series of thought-provoking questions relating job shadowing to their career plans and evaluate how the experience may affect their career choice. Students also write thank you letters to their hosts after the experience.

As part of the 10th-grade *Quest for Quality* portfolio, students write a three- to five-paragraph summary describing their job encounters. They also complete two-page overview sheets listing their job shadowing experiences and their research into career opportunities, salary possibilities, and required training and education.

The 10th-grade portfolio includes a title page with the student's picture, copies of thank you letters, a summary composition, an overview, and an evaluation of the student's oral presentation. This presentation is conducted in English classrooms during the final weeks of school. The presentations follow a teaching unit on public speaking to help students refine their presentation skills.

The 11th Grade Practicum

Quest for Quality is being expanded to include a non-paid pre-employment experience known as a practicum. This activity allows 11th grade students to test their vocational-technical and employability skills in a work setting. Students work a total of 20 to 40 hours in entry-level positions within a field of study. They work under the close supervision of a professional who evaluates their performance. Students develop supporting documents similar to those required for job shadowing to include in their portfolios.

The 12th Grade Cooperative Work Experience

Performance guides serve as a valuable resource for students' 12th grade co-op experiences. Co-op work gives students an opportunity to work for pay at a job related to their vocational area while finishing their academic credits for graduation. These experiences are recorded in the Student Performance Guide that teachers now promote as preparation for job hunting or higher education.

Results

Although the class of 1996 will be the first group to complete the four-year *Quest for Quality* program, evaluations by students, staff, and business representatives indicate the program's success in raising students' awareness, enthusiasm, and performance. All parties believe the program helps students formalize a vision of the future and take more responsibility for their lives and education. The program motivates students to do their best and builds self-esteem while enabling them to demonstrate more competence in academic, personal, group interaction, and vocational-technical skills.

Quest for Quality is working. Students are learning more about themselves, and the more they learn, the better equipped they become to make choices in their vocational areas.

Exhibit 16
Howard High School of Technology
Quest for Quality

Ninth Grade Program
Credo

Howard High School of Technology students, teachers, and parents/guardians believe that education is the key to success. Together we believe that:

- All students can learn.
- Learning requires effort.
- High expectations must be established for learners.
- Regular attendance is necessary for school success.
- The school must provide quality learning experiences.
- Positive communication must take place among students, teachers, and parents/guardians.
- Parents/Guardians must support students and teachers in the learning process.

As a student:

I realize that the greatest power in the world is the power of knowledge.
I want an education. Uneducated people go through life missing so many rewards that could be theirs.

I will become expert in the basic skills

I will read books that interest me as well as books on other subjects to broaden my awareness of what is happening in the world around me.

I will discuss at dinnertime what I have learned or questioned at school each day.

I will set aside some time each day to think about my future and discuss it with people I respect. I will work toward gaining the knowledge that can help guarantee that future.

I pledge this to those who love me and are trying to help me succeed. More important, I pledge this to myself.

We, the undersigned, pledge our energies and support to seeing that members of the 19____ Freshman Class of Howard High School of Technology have a productive school year.

_____ _____

Student's Signature Staff Member's Signature

_____

Parent/Guardian's Signature

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Exhibit 17
Howard High School of Technology

Student Performance Guide
Portfolio Item Log

Directions: In the **Item #** column, write the numbers for each document as you store them in your Portfolio, beginning with **1** for the first document, **2** for the second document, etc. Briefly describe each document, as a reminder to yourself, in the **Item Description** column. Check the year the item is entered. Indicate the skills area the item best validates: **Academic – Personal – Group Interaction.**

Item #	Item Description	Year Entered				Portfolio Section		
		9	10	11	12	A	P	GI

Exhibit 18

Howard High School of Technology

Portfolio

Employability Skills

Academic

Academic Skills help prepare you for future training and education. They include communicating, planning, understanding, and problem solving. Employers want you to:	Record item number for the skills represented.			
	I Certificates Papers Charts, Graphs Recommendations Leadership Positions Commendations	II Test Papers Report Cards Standardized Tests Transcripts Authentic Assessment	III Best Works	IV Other
1. Read with understanding.				
2. Understand charts and graphs.				
3. Understand basic mathematics.				
4. Use mathematics to solve problems.				
5. Use research and library skills.				
6. Use tools and equipment.				
7. Use oral language effectively.				
8. Use written language effectively.				
9. Use problem-solving skills.				
10. Use technology.				
11. Demonstrate an integration of skills.				
12. Perform multiple tasks.				
13. Use resources productively.				

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Exhibit 19

Howard High School of Technology

Portfolio

Employability Skills

Personal

Personal Skills help you develop responsibility and dependability. They include setting and accomplishing goals, doing your best in making decisions, acting honestly, and exercising self control. Employers want you to:	Record item number for the skills represented.			
	I Certificates Papers Charts, Graphs Recommendations Leadership Positions Commendations	II Test Papers Report Cards Standardized Tests Transcripts Authentic Assessment	III Best Works	IV Other
1. Attend school/work regularly.				
2. Meet school/work deadlines.				
3. Develop career plans.				
4. Know strengths and weaknesses.				
5. Demonstrate self-control.				
6. Attend to details.				
7. Follow instructions – oral and written.				
8. Work independently.				
9. Learn new skills.				
10. Display creativity.				
11. Demonstrate integrity/honesty/respect.				
12. Display loyalty.				
13. Give attention to quality.				
14. Display appropriate grooming.				
15. Deal effectively with clients.				
16. Demonstrate judgment.				

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Exhibit 20

Howard High School of Technology

Portfolio

Employability Skills

Group Interaction

Group Interaction Skills help develop your ability to work cooperatively with a group. They include organizing, planning, listening, sharing, flexibility, and leadership. Employers want you to:	Record item number for the skills represented.			
	I Certificates Papers Charts, Graphs Recommendations Leadership Positions Commendations	II Test Papers Report Cards Standardized Tests Transcripts Authentic Assessment	III Best Works	IV Other
1. Actively participate in group.				
2. Know group rules and values.				
3. Listen to group members.				
4. Express ideas to group members.				
5. Be sensitive to group members.				
6. Compromise to best accomplish a goal.				
7. Lead or follow to best accomplish a goal.				
8. Work in changing settings.				

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